Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Spring Fork Lake

Waterbody Segment at a Glance:

County: Pettis
Nearby Cities: Cole Camp
Area of impairment: 178 acres
Pollutant: Nutrients
Source: Agricultural Nonpoint Source Pollution


State map showing location of watershed

TMDL Priority Ranking: Medium

Description of the Problem

Beneficial uses of Spring Fork Lake

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Boating and Canoeing
- Drinking Water Supply

Use that is impaired

- Drinking Water Supply

Standards that apply

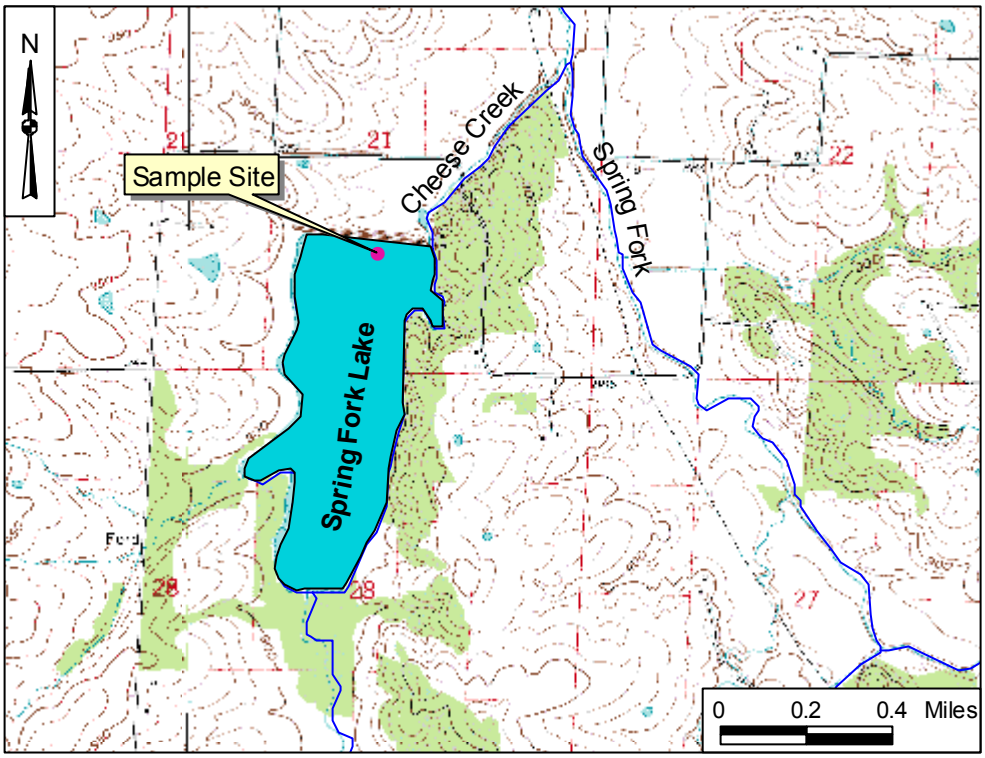
- The impairment of Spring Fork Lake is based on exceedence of the general criteria contained in Missouri's Water Quality Standards, 10 CSR 20-7.031 (3)(A) and (C). These criteria state:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background information and Water Quality Data

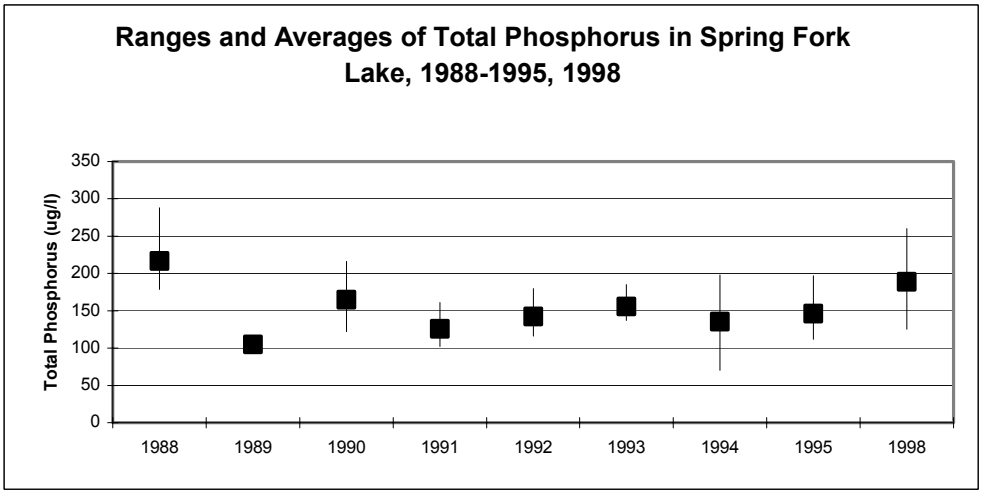
Spring Fork Lake serves as a drinking water source for the City of Sedalia. There have been occasional complaints about taste and odor problems in the city's drinking water supply. Taste and odor problems are usually related to the presence of large amounts of algae (especially when there is a sudden die-off) in a drinking water supply source. Large algal populations are stimulated by excess amounts of nitrogen and phosphorus (nutrients). The watershed of Spring Fork Lake is agricultural in nature, with commercial fertilizer use and animal manure being significant sources of nitrogen and phosphorus. A local watershed group is being organized to write a Source Water Protection plan to protect their drinking water reservoir. This volunteer group will look at what can be done to protect

the reservoir. For example, implementation of nutrient management plans on farms in this watershed may be effective in reducing the present problem. Also, since there is only one sampling site and very little data, members of the watershed group were trained to do lake and stream monitoring. The programs that provide this training are the Missouri Lakes Volunteer Program and Water Quality Volunteer Monitoring under the Missouri Stream Team program. When the TMDL is written, it will determine a numeric endpoint for phosphorus and nitrogen. The plan the group develops can become the implementation plan for the TMDL to meet that endpoint. A map of the area and graphs summarizing the data may be found below.

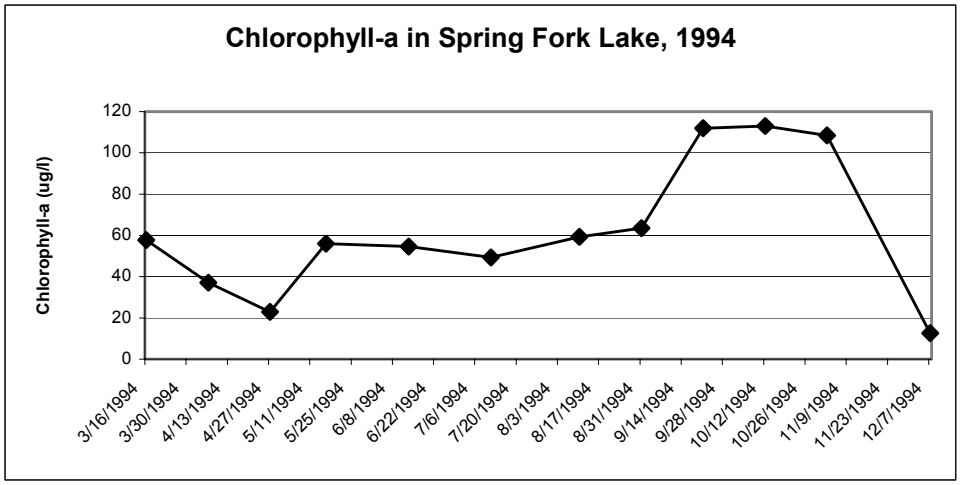
Spring Fork Lake in Pettis County, Missouri



The first graph below shows the phosphorus levels in Spring Fork Lake from 1988 – 1998. While Missouri does not have specific standards for nutrients, 25 µg/L (micrograms per liter or parts per billion) has been suggested for the nutrient phosphorus standard for lakes. Furthermore, 27 µg/L was calculated for the McDaniel Lake TMDL as the concentration of phosphorus that would limit chlorophyll-a (found in the second graph) to 10 µg/L. Chlorophyll-a occurs in all green plants and is used as a measure of the amount of algae. When a certain type of algae, blue-green algae, die, they release the particular compounds that cause unpleasant taste and odor. It has been found that suspended chlorophyll-a predicts the risk of dominance of blue-green algae. This risk increases exponentially in lakes when chlorophyll-a exceeds 10 µg/L.



Source: Dr. Jack Jones, Professor of Limnology, University of Missouri, Columbia



Source: Dr. Jack Jones, Professor of Limnology, University of Missouri, Columbia

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